

SONY

ELECTRONIC VIEWFINDER

BVF-V20W
BVF-V20WCE

MAINTENANCE MANUAL

2nd Edition (Revised 1)

Serial No. 11261 and Higher (BVF-V20W)

Serial No. 42441 and Higher (BVF-V20WCE)

△警告

このマニュアルは、サービス専用です。
お客様が、このマニュアルに記載された設置や保守、点検、修理などを行うと感電や火災、人身事故につながることがあります。
危険をさけるため、サービストレーニングを受けた技術者のみご使用ください。

△WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

△WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlag, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegebenen Wartungsaarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

△AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l'entretien. Afin de réduire les risques de décharge électrique, d'incendie ou de blessure n'effectuer que les réparations indiquées dans le mode d'emploi à moins d'être qualifié pour en effectuer d'autres. Pour toute réparation faire appel à une personne compétente uniquement.

X-RAY RADIATION WARNING

Be sure that parts replacement in the high voltage block and adjustments made to the high voltage circuits are carried out precisely in accordance with the procedures given in this manual.

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Manual Structure

Purpose of this manual

This manual is the maintenance manual for Electronic Viewfinder BVF-V20W/V20WCE.

This manual describes the information items necessary when the unit is supplied and installed, items that premise the service based on the components parts such as alignment, schematic diagrams, board layouts and spare parts lists, assuming use of system and service engineers.

Contents

This followings are summaries of the each section for understanding the manual.

Section 1 Service Overview

Describes information about board locations, connector input/output signals, cleaning, replacement of CRT.

Section 2 Electrical Alignment

Describes general information for electrical adjustments and the adjustments procedures of this unit.

Section 3 Spare Parts

Describes parts list, exploded views, supplied accessories list used in the unit.

Section 4 Semiconductor Pin Assignments

Describes function diagrams and pin names of semiconductor used in the unit.

Section 5 Diagrams and Board Layouts

Describes overall block diagram, frame wiring and board layouts for every circuit board.

Relative manual

Besides this maintenance manual the following manual is available for this unit.

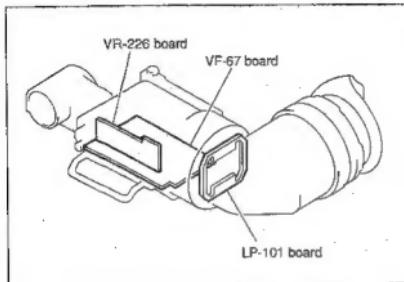
- **Operation Manual (Supplied with this unit)**

This manual is necessary for application and operation of this unit.

Section 1

Service Overview

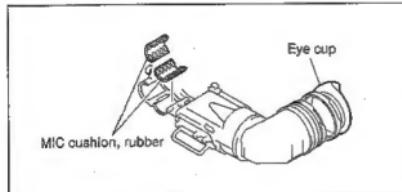
1-1. Location of Printed Circuit Boards



1-2. Periodic Replacement Parts

Parts listed below are periodic replacement parts. They are subject to cracks with the lapse of time. Check sometimes by visual, and replace as necessary.

| Name | Sony Part No. |
|---------------------|----------------------------|
| MIC cushion, rubber | 3-692-138-0X ^{*1} |
| Eye cup (S) | 3-723-079-0X |



*1 It is recommended that the MIC cushions are replaced in pairs. In this case, please order two pieces.

1-3. Connector Input/Output Signals

VF (20P MALE)



(External view)

| Pin No. | Signal | I/O | Specifications |
|---------|--------------|------------------------|--|
| 1 | VTR SAVE IND | IN | GND:Indicator lights OPEN:Indicator goes out |
| 2 | ABNORMAL IND | IN | GND:Indicator lights OPEN:Indicator goes out |
| 3 | 16:9 MODE | IN | GND:16:9 OPEN:4:3 |
| 4 | REC (L) IND | IN | 9 V:Indicator lights GND or OPEN:Indicator goes out |
| 5 | NC | | |
| 6 | CCIR/EIA | IN | 9.3 V:CCIR GND:EIA |
| 7 | DISPLAY | OUT ON:OPEN OFF:GND | |
| 8 | G TALLY | IN | 5 V:Indicator lights GND or OPEN:Indicator goes out |
| 9 | NC | | |
| 10 | NC | | |
| 11 | ZEBRA | OUT ON:GND OFF:5 V | |
| 12 | VF VIDEO (X) | IN | 1.0 V p-p Z _l = 75 Ω |
| 13 | NC | | |
| 14 | NC | | |
| 15 | NC | | |
| 16 | BATT IND | IN | 5 V:Indicator lights GND or OPEN:Indicator goes out |
| 17 | TALLY IND | IN | 9 V:Indicator lights GND or OPEN:Indicator goes out |
| 18 | +9.3 V (VF) | IN | REG +9.3 V |
| 19 | GND | | GND |
| 20 | NC | | |

This unit normally operates with the above input signals. Cameras described in this manual can output the signals satisfying the specifications.

1-4. Cleaning

1-4-1. Cleaning of Viewfinder

By extracting VF tube sub assembly, lens and MC protector can be easily cleaned. And also dust on the CRT surface or mirror can be easily cleaned off.

1. Turn the hold ring to the left and extract the VF tube sub assembly.
2. Detach the eyecup.
3. Remove the MC protector with the filter holder.
4. Clean the lens and MC protector with a commercially available camera lens cleaner. Blow off dust with a blower carefully so as not to flaw the mirror.
5. After the cleaning is completed, install by reversing the preceding steps. Align red lines of the VF tube and VF tube sub assembly when inserting, and turn the hold ring to the right until it locks.

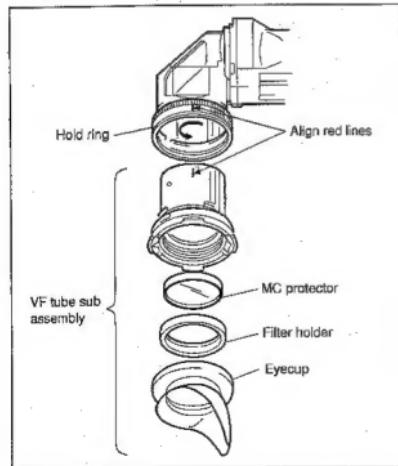
Note

- Do not use any type of solvent, such as alcohol, benzine or thinner to remove stains.
- Be sure to attach the eyecup to the VF, or the MC protector may come off.
- To protect the viewfinder lens from drops, put the MC protector in the filter holder and attach the eyecup securely.

1-4-2. Care After Using at Special Environment

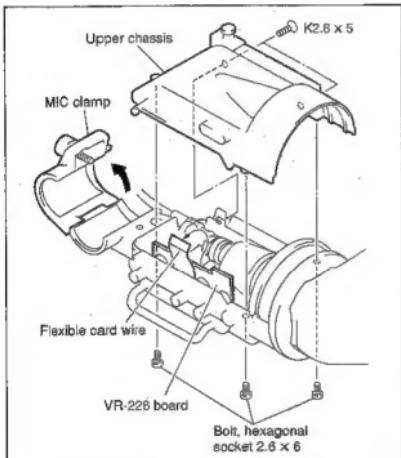
It is recommended to check the following items after gathering the news at seaside, dust area or spa.

1. Clean off sand and other dust in the unit carefully.
2. Do not allow salt in seawater or sulfur in spa to contact a not-painted surface of the cabinet. They may cause to corrode. Clean with alcohol immediately if contacted.
3. Clean the connection surface of connectors.
4. Carry out the common operation check.

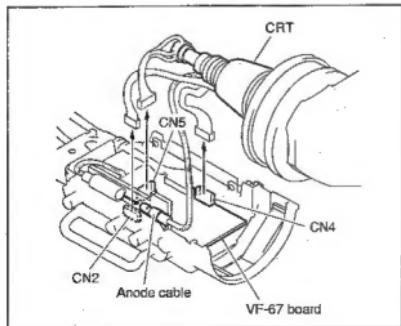


1-5. Replacement of CRT

1. Loosen the screw of the MIC clamp and open the MIC clamp.
2. Remove the two screws ($K2.6 \times 5$).
3. Remove the three hexagonal socket bolts (2.6×6) and remove the upper chassis.
4. Disconnect the flexible card wire on the VR-226 board.
(How to disconnect the flexible card wire, refer to Section 1-6.)

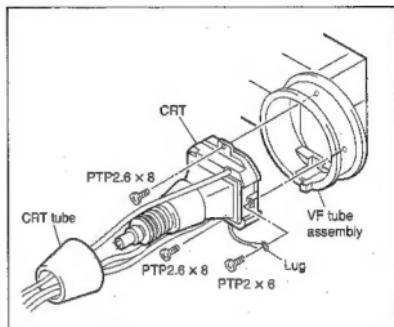


5. Disconnect the three connectors CN2, CN4 and CN5 on the VF-67 board, and anode cable.



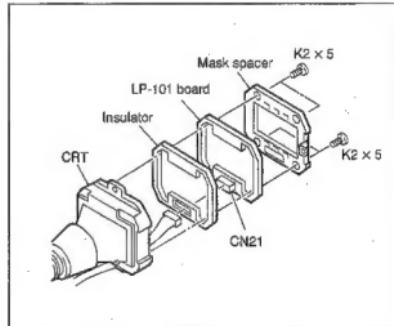
6. Remove the three screws and remove the CRT from the VF tube assembly.

7. Remove the CRT tube from the CRT.



8. Remove the four screws ($K2 \times 5$) and remove the mask spacer.

9. Disconnect the connector CN21 on the LP-101 board.



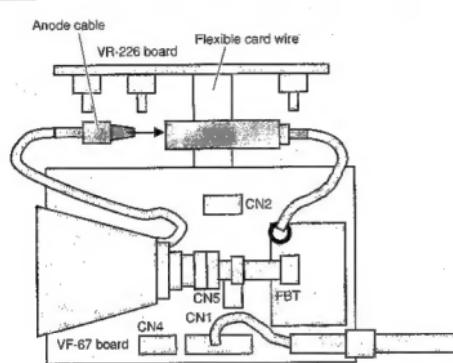
10. Install a new CRT in the reverse procedures of removal.

When installing the CRT, route the harness using the following procedure.

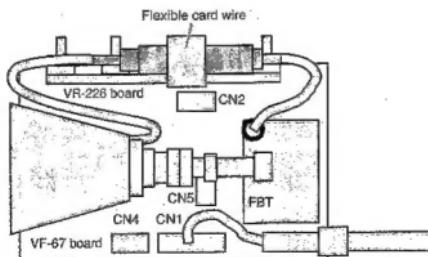
The following figures show the opposite side of the CRT shown in the figures of the removal procedure.

(1) Anode cable

Connect the anode cable.

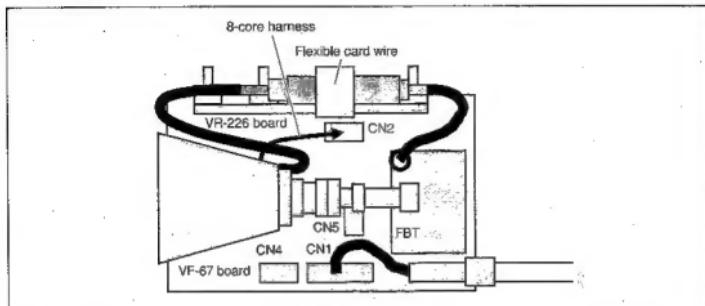


Turning the VR-226 board 180°, attach it to the cabinet. Bite the anode cable between the flexible card wire and the VR-226 board to secure it.



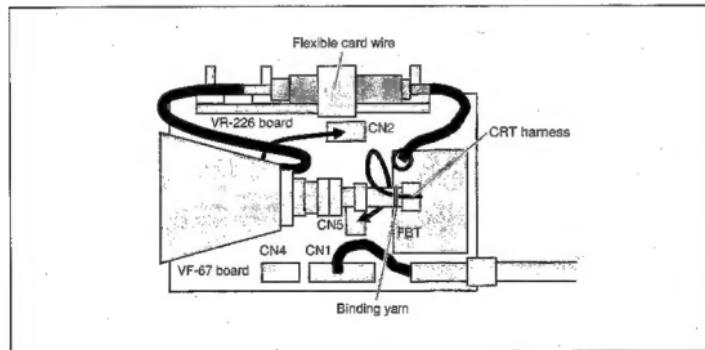
(2) Harness to connector CN2 (8-core harness)

Connect the 8-core harness to connector CN2 on the VF-67 board through the upper side of the anode cable.



(3) Harness to connector CN5 (CRT harness)

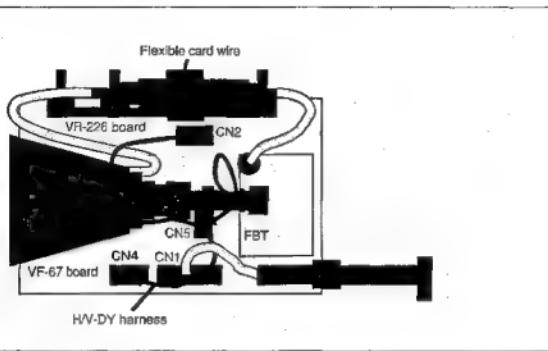
Connect the CRT harness (blue, orange, brown, red) to connector CN5 on the VF-67 board, and fix the CRT harness to the portion of the CRT neck using a binding yarn.



1-5. Replacement of CRT

(4) Harness to connector CN4 (H/V-DY harness)

Connect the H/V-DY harness (brown, red, orange, blue, black) to connector CN4 on the VF-67 board through the lower side of the VF cable.



Note

When installing the upper chassis, take care not to clamp the harness between upper and lower chassis.

After replacing the CRT, be sure to perform the electrical adjustment. (Refer to Section 2.)

Note

After adjustments are completed, paint-lock the centering magnet.

1-6. Disconnecting/Connecting Flexible Card Wire

The flexible card wire is used between the VF-67 board and VR-226 board. Take care not to break this flexible card wire. This shorten the wire life.

Disconnecting

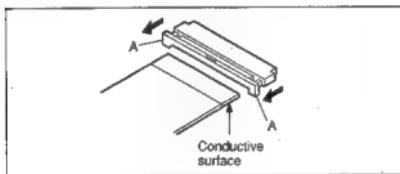
1. Turn off the power.
2. Slide portions A in the direction of the arrows to unlock and pull out the flexible card wire.

Connecting

Note

- Be careful not to insert the flexible card wire obliquely.
- Check that the conductive surface of the flexible card wire is not soiled with dust.

1. Slide portions A in the direction of the arrows and insert the flexible card wire as far as it will go with the conductive surface down.
2. Slide portions A in the reverse direction to lock.



1-7. Notes on Spare Parts

1. Safety Related Components Warning

Components marked Δ are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

2. Standardization of Parts

Some spare parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.

Parts list has the present standardized repair parts.

3. Stock of Parts

Parts marked with "o" at SP(Supply Code) column of the spare parts list may be not stocked. Therefore, the delivery date will be delayed.

4. Units Representation

The following represented units are changed or omitted in writing.

| Units | Representation |
|-------------|----------------|
| Capacitance | μF |
| Inductance | μH |
| Resistance | Ω |
| Temperature | $^{\circ}C$ |
| | Abbreviation |
| | XXX-DEG-C |

5. Destination Representation

The part indicated "For JUC/EK" in the spare parts list is used in the unit written below.

For UCJ : The part is used in a unit for U.S.A., Canada and Japan.

For CE : The part is used in a unit for regions except the above countries.

Section 2

Electrical Alignment

2-1. Electrical Adjustment Using a Camcorder

2-1-1. Notes on Adjustment

- When performing adjustment, read through the following comments.
- The calibration of all measuring equipment should be completed.
- Peripheral equipment (camera, and others) alignment should be completed.
- "2-1-4. Settings for adjustment" should be completed.
- Turn off the power before extending the plug-in board using the extension board.

[WARNING]

There is a danger of an electric shock around the CRT due to high voltage. Therefore, do not touch the CRT. Be very careful when service in a live.

2. Change the Picture Frame mode (4:3/16:9)

- When the unit is put into the 16:9 mode, set as follows.

Setting menu

PAGE : WIDE SCREEN

ITEM : 16:9/4:3 MODE → 16:9

- When the unit is put into the 4:3 mode, set as follows.

Setting menu

PAGE : WIDE SCREEN

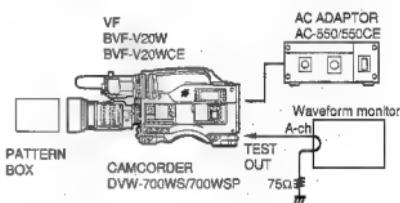
ITEM : 16:9/4:3 MODE → 4:3

2-1-2. Equipment/Fixtures

- Camcorder
DVW-700WS/700WSP
or DNW-90WS/90WSP
- AC adaptor
AC-550/550CE or equivalent
- Oscilloscope
Tektronix 2465B or equivalent
- Waveform monitor
Tektronix 1750/1751 or equivalent
- B/W monitor
- Digital voltmeter
Advantest TR6845 or equivalent
- Frequency counter
Advantest TR5821AK or equivalent

| Fixtures | Sony P/N |
|-------------------------|--------------|
| Pattern box "PTB-500" | J-6026-140-B |
| Resolution chart (4:3) | J-6026-100-A |
| Resolution chart (16:9) | J-6394-320-A |
| VF extension harness | J-6395-050-A |

2-1-3. Connections



2-1-4. Settings for Adjustment

Before adjustment, set switches as follows. If the setting of the GAIN switch is changed from the factory-set value, reset it to its original value, reset it to its original value by referring to the operation manual.

[External]

Side panel:

| | |
|-------------------------|------------|
| VTR SAVE/STBY switch | → STBY |
| GAIN switch | → L (0 dB) |
| OUTPUT/DCC switch | → CAM/OFF |
| WHITE BAL switch | → PRST |
| MENU/ON/OFF/PAGE switch | → OFF |

Front panel:

| | |
|-----------------|--------|
| SHUTTER switch | → OFF |
| FILTER selector | → 1, B |

[Lens]

| | |
|------|-------------|
| LENS | → MANU |
| IRIS | → C (CLOSE) |

(To be continued)

2-1. Electrical Adjustment Using a Camcorder

[Internal]

Put the unit into the ENG mode.

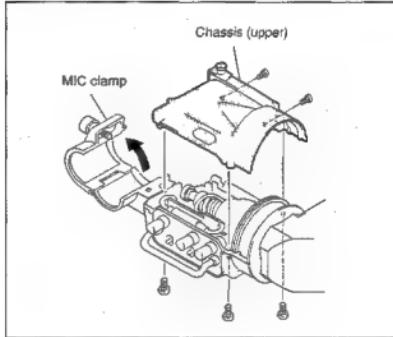
Note Refer to the maintenance manual part 1 of camcorder as for setting to the ENG mode.

Setting menu:

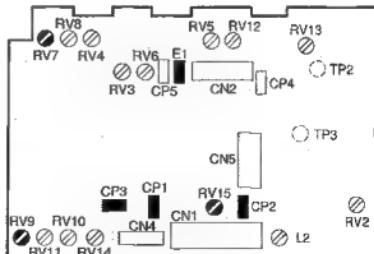
- MASTER GAIN
 - LOW → 0 dB
 - MID → 9 dB
 - HIGH → 18 dB
- FUNCTION 1/2
 - DETAIL → ON
 - SKIN TONE DETAIL → OFF
 - MATRIX → OFF
 - GAMMA → ON
 - CHROMA → ON
 - TEST SAW → OFF
- FUNCTION 2/2
 - GENLOCK → ON
 - CAM RET → OFF
 - FILTER INH → ON
- TEST OUT
 - ENC
- WIDE SCREEN
 - 16:9/4:3 MODE → 4:3
 - VF ASPECT → AUTO
- LEVEL 3/9
 - KNEE → ON
 - WHITE CLIP → ON
- LEVEL 4/9
 - I → ON
(for DVW-700WS)
 - Q → ON
(for DVW-700WS)
 - R-Y → ON
(for DVW-700WSP,
DNW-90WS/90WSP)
 - B-Y → ON
(for DVW-700WSP,
DNW-90WS/90WSP)

2-1-5. Extending Viewfinder

1. Turn off the power switch on the camera before performing adjustment.
2. Remove the viewfinder from the camera, then remove the chassis (upper)



3. Connect the viewfinder to the camera using the VF extension harness (J-6395-050-A).
4. Turn on the main power switch.



VF-67 BOARD (A SIDE)

2-1-6. Vertical Hold Adjustment

Preparation

- Extract the ES-11 board from the camcorder.
(DNW-90WS/90WSP)
- Extract the IF-443 board from the camcorder.
(DVW-700WS/700WSP)

Adjustment Procedure

- Equipment : Frequency counter
Test point : CP3/VF-67
GND : EI/VF-67
Adjustment point : **•RV9 (V-HOLD) /VF-67**
Specification : 48.0 ± 0.5 Hz (For NTSC)
 38.0 ± 0.5 Hz (For PAL)

Setting after Adjustment

- Attach the ES-11 board to the camcorder.
(DNW-90WS/90WSP)
- Attach the IF-443 board to the camcorder.
(DVW-700WS/700WSP)

2-1-7. Horizontal Hold Adjustment

Preparation

- Extract the ES-11 board from the camcorder.
(DNW-90WS/90WSP)
- Extract the IF-443 board from the camcorder.
(DVW-700WS/700WSP)

Adjustment Procedure

- Equipment : Frequency counter
Test point : CPI/VF-67
GND : EI/VF-67
Adjustment point : **•RV7 (H-HOLD) /VF-67**
Specification : 15.73 ± 0.05 kHz (For NTSC)
 15.63 ± 0.05 kHz (For PAL)

Setting after Adjustment

- Attach the ES-11 board to the camcorder.
(DNW-90WS/90WSP)
- Attach the IF-443 board to the camcorder.
(DVW-700WS/700WSP)

2-1-8. Sub Contrast Adjustment

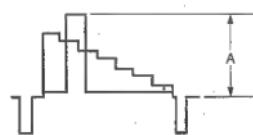
Preparation

- OUTPUT/DCC switch (on the camcorder side panel)
→ BARS/OFF
- CONTRAST control → Fully clockwise

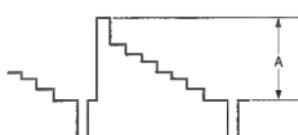
Adjustment Procedure

- Equipment : Oscilloscope
Test point : CP2/VF-67
GND : EI/VF-67
Adjustment point : **•RV15 (SUB CONTRAST) /VF-67**
Specification : $A=10.0 \pm 0.1$ V p-p (without sync)

For NTSC model



For PAL model



2-1-9. Bright Set Adjustment

Preparation

- Set to the 4:3 mode.
- OUTPUT/DCC switch (on the camcorder side panel)
→ BARS/OFF
- BRIGHT control → Mechanical center
- CONTRAST control → Mechanical center

Adjustment Procedure

- Adjustment point : **ORV2 (SUB BRIGHT) /VF-67**
Specification : Refer to lower figure
- Set to the 16:9 mode.
- Adjustment point : **ORV4 (SUB BRIGHT WIDE) / VR-226**
Specification : Refer to lower figure

For NTSC model

Adjustment method

: Adjust **ORV2 (ORV4)** so that the black of portions A (front-porch) or B (back-porch) on the viewfinder screen can be barely discriminated black.

Portions A, B and the blanking of A or B's side cannot be discriminated.

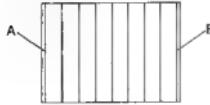


For PAL model

Adjustment method

: Adjust **ORV2 (ORV4)** so that the black of portions A (front-porch) or B (back-porch) on the viewfinder screen can be barely discriminated black.

Portions A, B and the blanking of A or B's side cannot be discriminated.



2-1-10. Focus Adjustment

Note

This adjustment, "2-1-11. Heater Voltage Adjustment" and "2-1-12. Picture Frame Adjustment" affect each other. Therefore, repeat these adjustments until these specifications are satisfied.

Preparation

- Set to the 16:9 mode.
 - Shoot the resolution chart (16:9) so that the chart frame is aligned with the underscanned monitor frame.
 - Adjust the iris of the lens so that the output level (peak-to-peak) at TEST OUT connector/camcorder with the waveform monitor.
- Spec. : 70 ± 2 IRE (for NTSC)
 490 ± 14 mV (for PAL)



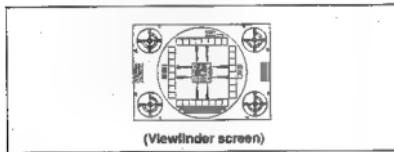
(Viewfinder screen)

- BRIGHT control → Mechanical center
- CONTRAST control → Mechanical center

Adjustment Procedure

- Adjustment point : **ORV5 (FOCUS SET) /VF-67**
Adjustment method : Turn **ORV5** fully counterclockwise, and slowly turn it clockwise to adjust the best focus position.
- Confirm that the best focus can be obtained irrespective of its BRIGHT and CONTRAST controls setting.
- Set to the 4:3 mode.

4. Set camera and viewfinder as follows.
- Shoot the resolution chart (4:3) so that the chart frame is aligned with the underscanned monitor frame.
 - Adjust the iris of the lens so that the output level (peak-to-peak) at TEST OUT connector/camcorder with the waveform monitor.
- Spec. : 70 ± 2 IRE (for NTSC)
 490 ± 14 mV (for PAL)



- BRIGHT control → Mechanical center
 - CONTRAST control → Mechanical center
 - Confirm that the focus operation can be performed.
5. Equipment : Digital voltmeter
 Test point : TP2/VF-67 (B SIDE)
 GND : EI/VF-67
 Adjustment point : \bullet RV12 (OPAMP-ADJ)/VF-67
 Specification : 6.0 ± 0.2 V dc

Note

After adjustments are completed, confirm that the best focus can be obtained irrespective of its BRIGHT and CONTRAST controls setting.

2-1-11. Heater Voltage Adjustment

Note

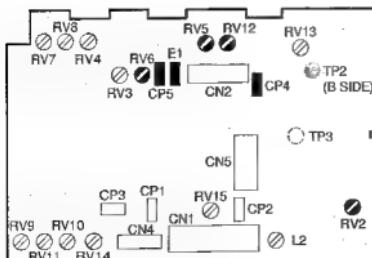
This adjustment, "2-1-10. Focus Adjustment" and "2-1-12. Picture Frame Adjustment" affect each other. Therefore, repeat these adjustments until these specifications are satisfied.

Preparation

- Set to the 4:3 mode.
- BRIGHT control → Mechanical center
- CONTRAST control → Mechanical center
- PEAKING control → Mechanical center
- Iris of the lens: Close

Adjustment Procedure

1. Equipment : Digital voltmeter
 Test point : CP4 (H1)/VF-67
 CP5 (H2)/VF-67
 Adjustment point : \bullet RV6 (HEATER)/VF-67
 Specification : 635 ± 15 mV dc
2. Confirm that the specification is met and horizontal noise irrespective of its BRIGHT, CONTRAST and PEAKING controls setting.
3. Set to the 16:9 mode.
4. Confirm that the specification is met and horizontal noise irrespective of its BRIGHT, CONTRAST and PEAKING controls setting.



VF-67 BOARD (A SIDE)

2-1-12. Picture Frame Adjustment

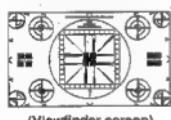
Note

This adjustment, "2-1-10. Focus Adjustment" and "2-1-11. Heater Voltage Adjustment" affect each other. Therefore, repeat these adjustments until these specifications are satisfied.

Preparation

- Set to the 16:9 mode.
- Shoot the resolution chart (16:9) so that the chart frame is aligned with the underscanned monitor frame.
- Adjust the iris of the lens so that the output level (peak-to-peak) at TEST OUT connector/camcorder with the waveform monitor.

Spec. : 70 ± 2 IRE (for NTSC)
 490 ± 14 mV (for PAL)



- BRIGHT control → Mechanical center
- CONTRAST control → Mechanical center

Adjustment Procedure

- Adjustment point : **•**RV7 (H-HOLD) /VF-67
 Specification : If the upper left corner of the picture is distorted, makes right angle.
- Adjustment point : **•**RV11 (V-LIN) /VF-67
•RV13 (H-LIN) /VF-67

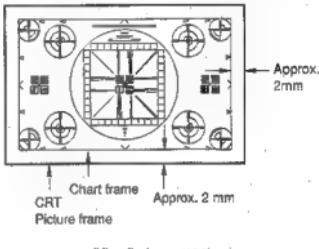


Specification : Minimize the distortion of the four circles at the corners of the resolution chart.

(To be continued)

- Adjustment point : **•**RV4 (H-SIZE WIDE) /VF-67
•RV10 (V-SIZE) /VF-67
•Centering magnet

Adjustment method : Adjust **•**RV4 and **•**RV10 so that the positions of the resolution chart are as shown below. Turn the centering magnet only when the left and lower corners cannot be adjusted.

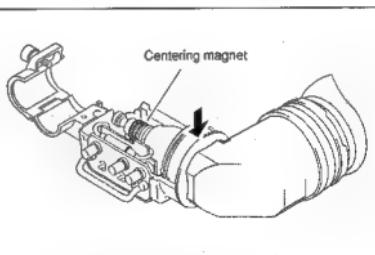


- Check that the required specification is met.

Test point : TP3/VF-67 (B SIDE)
 Specification : 8.80 ± 0.20 V dc

If not, repeat from step 3.

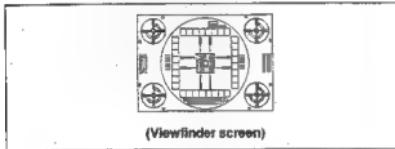
- Place the VF tube to the lower chassis as shown below, and confirm that the picture is in the center of the viewfinder in the normal installing position.



Note

When the centering magnet is turned, paint-lock it again.

6. Set to the 4:3 mode.
7. Shoot the resolution chart (4:3) so that the chart frame is aligned with the underscanned monitor frame.
8. Adjust the iris of the lens so that the output level (peak-to-peak) at TEST OUT connector/camcorder.
Spec. : 70 ± 2 IRE (for NTSC)
 490 ± 14 mV (for PAL)



9. Adjustment point : ●RV3 (H-SIZE) /VF-67
Specification : Minimize the distortion of center circle and the four circles at the corners of the resolution chart.
10. Check that the required specification is met.
Test point : TP3/VF-67 (B SIDE)
Specification : 6.95 ± 0.25 V dc
If not, repeat from step 9.

2-2. Electrical Adjustment Using a VF Checker

2-2-1. Notes on Adjustment

1. When performing adjustment, read throughly the following comments.
 - The calibration of all measuring equipment should be completed.
 - "2-2-4. Settings for adjustment" should be completed.

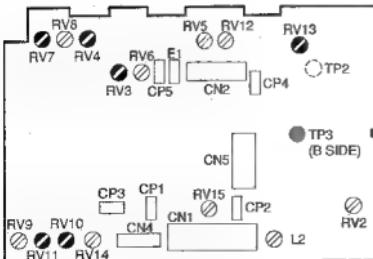
WARNING

There is a danger of an electric shock around the CRT due to high voltage. Therefore, do not touch the CRT. Be very careful when service in a live.

2-2-2. Equipment/Fixtures

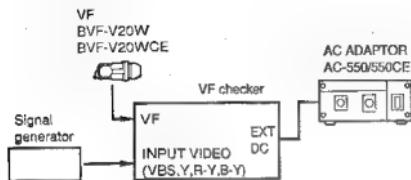
- Composite signal generator
Shibasoku TG21AX or equivalent
- Monoscope signal generator
Shibasoku TG21A1001 or equivalent [For NTSC]
Shibasoku TG21A2001 or equivalent [For PAL]
- AC adapter
Sony AC-550/550CE or equivalent
- Oscilloscope
Tektronix 2465B or equivalent
- Waveform monitor
Tektronix 1750/1751 or equivalent
- Frequency counter
Advantest TR5821AK or equivalent

| Fixtures | Sony P/N |
|----------------------|--------------|
| VF checker | J-6422-300-A |
| VF extension harness | J-6395-050-A |



VF-67 BOARD (A SIDE)

2-2-3. Connections



2-2-4. Settings for Adjustment

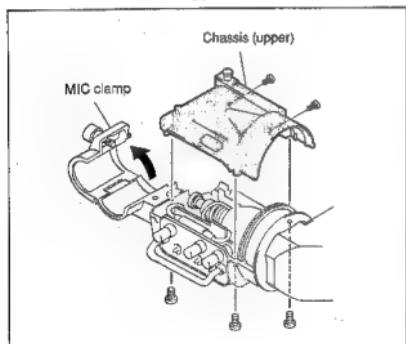
Set switches as follows before adjustment.

VF checker:

- INPUT VIDEO VBS switch → SG
- INPUT VIDEO Y/R-Y/B-Y switch → SG
- EIA/CCIR switch → EIA [For NTSC]
- EIA/CCIR switch → CCIR [For PAL]
- 16 : 9/4 : 3 switch → 4 : 3
- COMP/VBS switch → VBS

2-2-5. Extending Viewfinder

1. Remove the chassis (upper).



2. Connect the viewfinder to the VF checker using the VF extension harness (J-6395-050-A).

2-2-6. Vertical Hold Adjustment

Preparation

- Disconnect the cable from the VBS connector on the VF checker.

Adjustment Procedure

- | | | |
|------------------|---|---|
| 1. Equipment | : | Frequency counter |
| Test point | : | CP3/VF-67 |
| GND | : | E1/VF-67 |
| Adjustment point | : | ●RV9 (V-HOLD) /VF-67 |
| Specification | : | 48.0 ± 0.5 Hz (For NTSC) 38.0 ± 0.5 Hz (For PAL) |

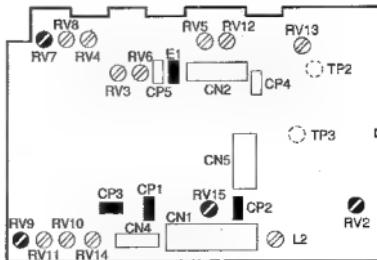
2-2-7. Horizontal Hold Adjustment

Preparation

- Disconnect the cable from the VBS connector on the VF checker.

Adjustment Procedure

- | | | |
|------------------|---|---|
| 1. Equipment | : | Frequency counter |
| Test point | : | CP1/VF-67 |
| GND | : | E1/VF-67 |
| Adjustment point | : | ●RV7 (H-HOLD) /VF-67 |
| Specification | : | 15.73 ± 0.05 kHz (For NTSC) 15.63 ± 0.05 kHz (For PAL) |



VF-67 BOARD (A SIDE)

2-2-8. Sub Contrast Adjustment

Preparation

- Input the color bars signal to the VBS connector on the VF checker.
- CONTRAST control → Fully clockwise

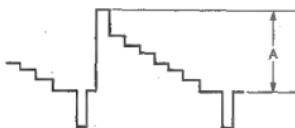
Adjustment Procedure

- Equipment : Oscilloscope
Test point : CP2/VF-67
GND : EI/VF-67
Adjustment point : **②RV15 (SUB CONTRAST) / VF-67**
Specification : $A=10.0 \pm 0.1 \text{ V p-p}$ (without sync)

For NTSC model



For PAL model



2-2-9. Bright Set Adjustment

Preparation

- 16:9/4:3 switch (VF checker) → 4:3
- Input the color bars signal to the VBS connector on the VF checker.
- BRIGHT control → Mechanical center
- CONTRAST control → Mechanical center

Adjustment Procedure

- Adjustment point : **②RV2 (SUB BRIGHT) / VF-67**
Specification : Refer to lower figure
- 16:9/4:3 switch (VF checker) → 16:9
- Adjustment point : **②RV4 (SUB BRIGHT WIDE) / VR-226**
Specification : Refer to lower figure

For NTSC model

Adjustment method

: Adjust **②RV2 (②RV4)** so that the black of portions A (front-porch) or B (back-porch) on the viewfinder screen can be barely discriminated black.

Portions A, B and the blanking of A or B's side cannot be discriminated.



For PAL model

Adjustment method

: Adjust **②RV2 (②RV4)** so that the black of portions A (front-porch) or B (back-porch) on the viewfinder screen can be barely discriminated black.

Portions A, B and the blanking of A or B's side cannot be discriminated.



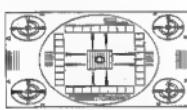
2-2-10. Focus Adjustment

Note

This adjustment, "2-2-11. Heater Voltage Adjustment" and "2-2-12. Picture Frame Adjustment" affect each other. Therefore, repeat these adjustments until these specifications are satisfied.

Preparation

- 16:9/4:3 switch (VF checker) → 16:9
- Input the monoscope (4:3) signal to the VBS connector on the VF checker.

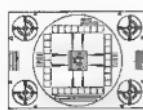


(Viewfinder screen)

- BRIGHT control → Mechanical center
- CONTRAST control → Mechanical center

Adjustment Procedure

1. Adjustment point : **•**RV5 (FOCUS SET) /VF-67
Adjustment method : Turn **•**RV5 fully counterclockwise, and slowly turn it clockwise to adjust the best focus position.
2. Confirm that the best focus can be obtained irrespective of its BRIGHT and CONTRAST controls setting.
3. 16:9/4:3 switch (VF checker) → 4:3



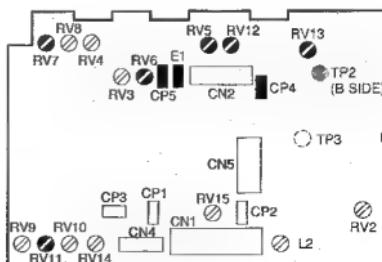
(Viewfinder screen)

- BRIGHT control → Mechanical center
- CONTRAST control → Mechanical center
- Confirm that the best focus can be obtained.

| | |
|------------------|------------------------------------|
| 4. Equipment | : Digital voltmeter |
| Test point | : TP2/VF-67 (B SIDE) |
| GND | : E1/VF-67 |
| Adjustment point | : • RV12 (OPAMP-ADJ) /VF-67 |
| Specification | : 6.0 ± 0.2 V dc |

Note

After adjustments are completed, confirm that the best focus can be obtained irrespective of its BRIGHT and CONTRAST controls setting.



VF-67 BOARD (A SIDE)

2-2-11. Heater Voltage Adjustment

Note

This adjustment, "2-2-10. Focus Adjustment" and "2-2-12. Picture Frame Adjustment" affect each other. Therefore, repeat these adjustments until these specifications are satisfied.

Preparation

- 16:9/4:3 switch (VF checker) → 4:3
- BRIGHT control → Mechanical center
- CONTRAST control → Mechanical center
- PEAKING control → Mechanical center
- Input the monoscope (4:3) signal to the VBS connector on the VF checker.
- Setting of the signal generator (TG21A1001)
 - LUMINANCE → OFF
 - CHROMINANCE → OFF
 - (Or input the black burst signal using another signal generator.)

Adjustment Procedure

1. Equipment : Digital voltmeter
Test point : CP4 (H1)/VF-67
CP5 (H2)/VF-67
Adjustment point : **●RV6 (HEATER)**/VF-67
Specification : 635 ± 15 mV dc
2. Confirm that the specification is met and horizontal noise irrespective of its BRIGHT, CONTRAST and PEAKING controls setting.
3. 16:9/4:3 switch (VF checker) → 16:9
4. Confirm that the specification is met and horizontal noise irrespective of its BRIGHT, CONTRAST and PEAKING controls setting.

Setting after Adjustment

TG21A1001

LUMINANCE → ON
CHROMINANCE → ON

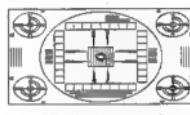
2-2-12. Picture Frame Adjustment

Note

This adjustment, "2-2-10. Focus Adjustment" and "2-2-11. Heater Voltage Adjustment" affect each other. Therefore, repeat these adjustments until these specifications are satisfied.

Preparation

- 16:9/4:3 switch (VF checker) → 16:9
- Input the monoscope (4:3) signal to the VBS connector on the VF checker.



(Viewfinder screen)

- BRIGHT control → Mechanical center
- CONTRAST control → Mechanical center

Adjustment Procedure

1. Adjustment point : **●RV7 (H-HOLD)**/VF-67
Specification : If the upper left corner of the picture is distorted, makes right angle.



(Viewfinder screen)

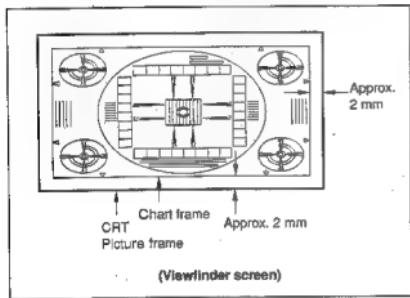
2. Adjustment point : **●RV11 (V-LIN)**/VF-67
●RV13 (H-LIN)/VF-67
Specification : Minimize the distortion of the four circles at the corners of the resolution chart.

(To be continued)

2-2. Electrical Adjustment Using a VF Checker

3. Adjustment point : **•RV4 (H-SIZE WIDE) /VF-67**
•RV10 (V-SIZE) /VF-67

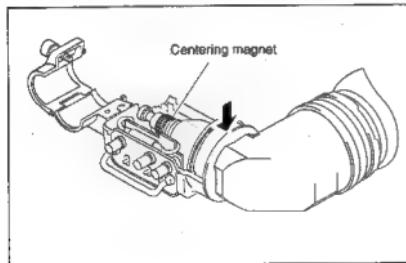
Adjustment method : Adjust **•RV4** and **•RV10** so that the positions of the resolution chart are as shown below. Turn the centering magnet only when the left and lower corners cannot be adjusted.



4. Check that the required specification is met.

Test point : TP3/VF-67 (B SIDE)
Specification : 8.80 ± 0.20 V dc
If not, repeat from step 3.

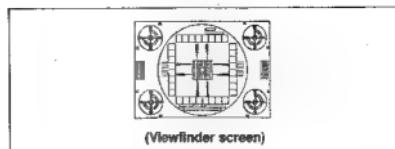
5. Place the VF tube to the lower chassis as shown below, and confirm that the picture is in the center of the viewfinder in the normal installing position.



Note

When the centering magnet is turned, paint-lock it again.

6. 16:9/4:3 switch (VF checker) → 4:3



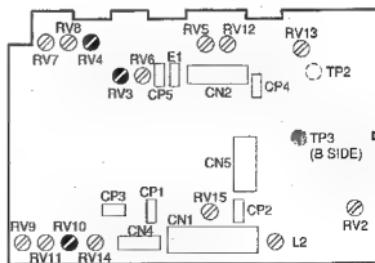
7. Adjustment point : **•RV3 (H-SIZE) /VF-67**

Specification : Minimize the distortion of center circle and the four circles at the corners of the resolution chart.

8. Check that the required specification is met.

Test point : TP3/VF-67 (B SIDE)
Specification : 6.95 ± 0.25 V dc

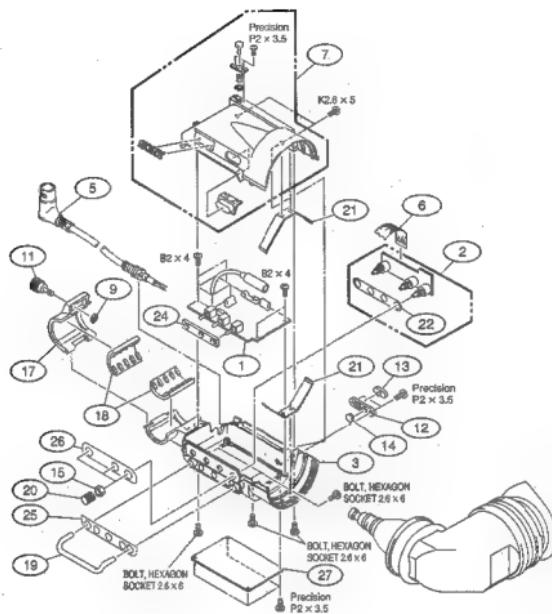
If not, repeat from step 7.



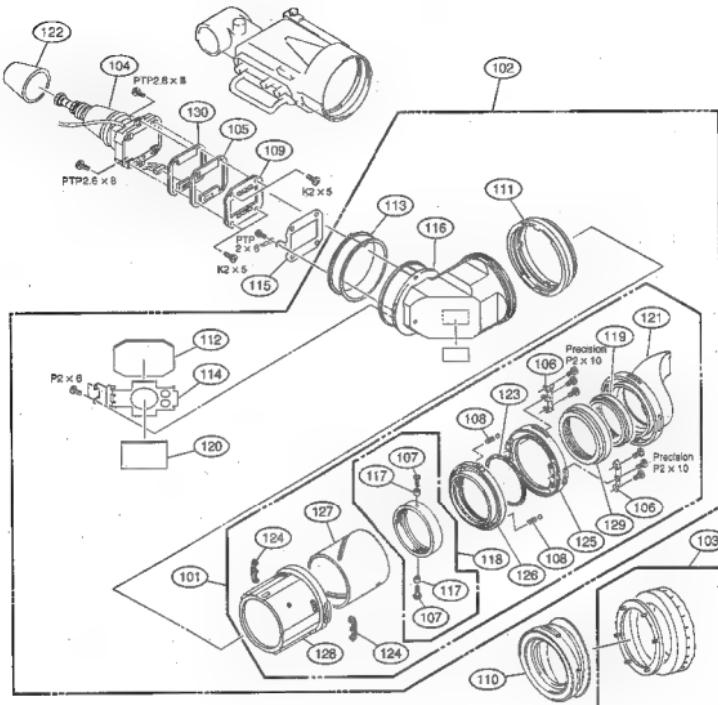
VF-67 BOARD (A SIDE)

Section 3 Spare Parts

3-1. Exploded Views



Viewfinder



| No. | Part No. | SP Description |
|-----|--------------|---------------------------------|
| 101 | A-8262-798-A | s TUBE SUB ASSY, VF |
| 102 | A-8277-114-B | s TUBE ASSY, VF |
| 103 | X-3678-187-1 | m CUSHION, EYE CUP ASSY |
| 104 | 1-251-439-11 | s CRY/DY ASSY, 2" WIRE |
| 105 | 1-761-131-11 | c MOUNTED CIRCUIT BOARD, LP-105 |
| 106 | 3-176-414-01 | o RETAINER, RING |
| | 3-335-207-01 | s SHAFT, MOTOR |
| 108 | 3-573-150-00 | s SPRING, COMPRESSION |
| 109 | 9-682-882-01 | o SPACER, MASK |
| 110 | 3-682-494-02 | o EYE, CUP (S) |
| 111 | 3-692-136-02 | o FIXED RING |
| 112 | 3-692-139-01 | o MIRROR (2) |
| 113 | 3-697-151-01 | o RING, VF |
| 114 | 3-697-154-01 | o HOLDER, MIRROR(3) |
| 115 | 3-697-159-01 | o PLATE A, DISPLAY |
| 116 | 3-697-167-02 | o VF TUBE (4) |
| 117 | 3-722-485-01 | o ROLLER, SLIDE |
| 118 | X-3608-271-3 | m ASSY, VF LENS |
| 119 | 3-723-069-02 | o PROJECTOR, MC |
| 120 | 3-723-073-01 | o CUSHION, MIRROR |

| No. | Part No. | SP Description |
|-----|--------------|-----------------------------------|
| 121 | 3-723-079-02 | s EYE CUP |
| 122 | 3-723-220-02 | s TUBE (A), CRT |
| 123 | 3-725-904-01 | o RING (NT), O |
| 124 | 3-742-038-01 | o NUT (2), PLATE |
| 125 | 3-742-052-03 | o HOLDER, EYE CUP |
| 126 | 3-742-053-02 | o RING |
| 127 | 3-742-054-01 | s TUBE |
| 128 | 3-742-060-01 | o HOLDER, RING |
| 129 | 3-742-075-01 | o HOLDER, FILTER |
| 130 | 9-882-884-01 | o INSULATOR |
| | 7-624-200-01 | s NUT, PUSH 1.5 |
| | 7-624-102-C4 | s STOP RING 1.5, TYPE-E |
| | 7-627-452-38 | s SCREW, PRECISION :K 2X5 |
| | 7-627-533-78 | m SCREW, PRECISION :P 2X10 |
| | 7-671-158-01 | s BALL, STAINLESS (2.5 DIA) |
| | 7-685-104-19 | s SCREW #P#P 2X6 TYPE2 NON-SLIT |
| | 7-685-134-19 | s SCREW #P#P 2.6X8 TYPE2 NON-SLIT |

3-2. Electrical Parts List

IP-105 BOARD

Ref. No.
or Q'ty Part No. SP Description

Ipc 1-761-131-11 o MOUNTED CIRCUIT BOARD, IP-105
 CW21 1-565-651-11 o CONNECTOR 8P, MALE
 D1 8-719-026-39 s LED CL-150UR-CD, RED
 D2 8-719-026-39 s LED CL-150UR-CD, RED
 D3 8-719-987-43 s LED CL-150PG-CD, GRN
 D4 8-719-026-16 s LED CL-150D-CD, ORG
 D5 8-719-026-39 s LED CL-150UR-CD, RED
 D6 8-719-026-16 m LED CL-150D-CD, ORG

VF-67 BOARD

Ref. No.
or Q'ty Part No. SP Description

Ipc 1-761-129-11 m MOUNTED CIRCUIT BOARD, VF-67 (DCJ)
 Ipc 1-761-129-21 o MOUNTED CIRCUIT BOARD, VF-67 (CE)
 C1 1-163-037-11 s CERAMIC, CHIP 0.022uF 10% 25V
 C2 1-163-021-11 s CERAMIC, CHIP 0.01uF 10% 50V
 C3 1-163-021-11 s CERAMIC, CHIP 0.01uF 10% 50V
 C4 1-163-021-11 s CERAMIC, CHIP 0.01uF 10% 50V
 C5 1-113-662-11 s TANTALUM 33uF 20% 10V
 C6 1-113-985-11 s TANTALUM 10uF 20% 20V
 C8 1-163-249-11 s CERAMIC, CHIP 82PF 5% 50V
 C9 1-135-214-21 s TANTALUM 4.7uF 10% 20V
 C10 1-113-985-11 s TANTALUM 10uF 10% 20V
 C11 1-163-021-11 s CERAMIC, CHIP 0.01uF 10% 50V
 C12 1-163-021-11 s CERAMIC, CHIP 0.01uF 10% 50V
 C13 1-125-988-21 s TANTALUM 330uF 20% 25V
 C14 1-163-038-11 s CERAMIC 0.1uF 25V
 C15 1-137-689-11 s TANTALUM 47uF 16V
 C17 1-163-259-11 s CERAMIC, CHIP 220PF 5% 50V
 C18 1-163-021-11 s CERAMIC, CHIP 220PF 5% 50V
 C19 1-163-243-11 s CERAMIC, CHIP 47PF 5% 50V
 C20 1-163-038-11 s CERAMIC 0.1uF 25V
 C21 1-163-038-11 s CERAMIC 0.1uF 25V
 C25 ▲ 1-137-150-11 s FILM 0.01uF 5% 100V
 C26 1-163-609-11 s CERAMIC 0.047uF 10% 50V
 C27 1-135-214-21 s TANTALUM 4.7uF 10% 20V
 C28 1-107-425-11 s CERAMIC 470PF 10% 1KV
 C29 1-115-339-11 s CERAMIC 0.1uF 10% 50V
 C30 1-124-773-11 s ELECT 27uF 20% 63V
 C31 1-113-981-11 s TANTALUM 22uF 20V
 C32 ▲ 1-136-289-11 s FILM 0.0056uF 5% 100V
 C33 1-113-985-11 s TANTALUM 0.0056uF 5% 100V
 C35 1-107-689-21 s TANTALUM, CHIP 1uF 10% 35V
 C36 1-113-985-11 s TANTALUM 10uF 20% 20V
 C37 1-113-985-11 s TANTALUM 10uF 20% 20V
 C38 1-113-985-11 s TANTALUM 10uF 20% 20V
 C39 1-163-038-11 s CERAMIC 0.1uF 25V
 C40 1-163-038-11 s CERAMIC 0.1uF 25V
 C41 1-113-985-11 s TANTALUM 10uF 20% 20V
 C42 1-113-985-11 s TANTALUM 10uF 20% 20V
 C43 1-107-689-21 s TANTALUM, CHIP 1uF 10% 35V
 C44 1-163-019-11 s CERAMIC, CHIP 0.0068uF 10% 50V
 C45 1-113-985-11 s TANTALUM 10uF 20% 20V
 C46 1-104-547-11 s FILM 0.0047uF 5% 16V
 C47 1-163-037-11 s CERAMIC, CHIP 0.022uF 10% 25V
 C48 1-163-038-11 s CERAMIC 0.1uF 25V
 C49 1-163-038-11 s CERAMIC 0.1uF 25V
 C50 1-107-689-21 s TANTALUM, CHIP 1uF 10% 35V
 C51 1-107-689-21 s TANTALUM, CHIP 1uF 10% 35V
 C53 1-163-037-00 s CERAMIC, CHIP 0.0047uF 5% 50V
 C54 1-128-397-21 s ELECT 100uF 20% 16V
 C55 1-163-259-11 s CERAMIC, CHIP 220PF 5% 50V
 C56 1-113-985-11 s TANTALUM 10uF 20% 20V
 C57 1-107-687-11 s TANTALUM 3.3uF 20% 20V
 C58 1-163-038-11 s CERAMIC 0.1uF 25V
 C59 1-163-018-11 s CERAMIC, CHIP 0.0056uF 10% 50V
 C60 1-107-778-11 s ELECT 470uF 20% 16V
 C61 1-163-023-11 s CERAMIC 0.015uF 10% 50V

(VP-67 BOARD)

Ref. No.
or Q'ty Part No. SP Description

| | | |
|-----|--------------|-----------------------------------|
| C70 | 1-164-346-11 | s CERAMIC, CHIP 1uF 10V |
| C71 | 9-882-887-01 | s FILM 2400PF |
| C72 | 1-115-339-91 | s CERAMIC, CHIP 0.1uF |
| CN1 | 1-580-538-11 | o CONNECTOR, LX18P, MALE |
| CN2 | 1-764-080-21 | ■ CONNECTOR [PC BOARD] 8P, FEMALE |
| CN3 | 1-569-529-11 | s HOUSING, 14P |
| CN4 | 1-568-004-31 | o CONNECTOR 5P, MALE |
| CN5 | 1-568-004-31 | s CONNECTOR 5P, MALE |

| | | |
|----|--------------|---------------------|
| D1 | 8-719-941-86 | s DIODE D8N20ZC |
| D2 | 8-719-941-86 | s DIODE D8N20ZC |
| D3 | 8-719-029-68 | s DIODE BD6 20N9-T1 |
| D4 | 8-719-820-42 | s DIODE ISS302 |
| D5 | 8-719-941-86 | s DIODE D8N20ZC |

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|-----|--------------|--------------------|
| D6 | 8-719-976-56 | s DIODE RLS245 |
| D7 | 8-719-976-56 | s DIODE RLS245 |
| D8 | 8-719-941-86 | s DIODE D8N20ZC |
| D9 | 8-719-070-38 | s DIODE ESDA57-04A |
| D10 | 8-719-941-86 | s DIODE D8N20ZU |

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|-----|--------------|------------------|
| D11 | 8-719-941-86 | s DIODE D8N20ZU |
| D12 | 8-719-820-42 | s DIODE 18S30Z |
| D13 | 8-719-976-56 | s DIODE RLS245 |
| D14 | 9-904-843-01 | s DIODE HIK9C1TR |

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|-----|--------------|-------------------|
| D11 | 1-411-383-11 | s DELAY LINE 80ns |
|-----|--------------|-------------------|

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| FBT1 | ▲ 1-429-819-11 | s TRANSFORMER FLYBACK |
|------|----------------|-----------------------|

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| HLC1 | ▲ 9-882-891-01 | s COIL, HORIZONTAL LINEARITY |
|------|----------------|------------------------------|

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|-----|--------------|--------------------|
| IC2 | 8-759-209-54 | s IC TC420IF |
| IC3 | 8-759-242-64 | s IC TC4253T |
| IC4 | 8-759-144-72 | s IC OP73586Z-E2 |
| IC5 | 8-759-209-57 | s IC TC4569F |
| IC6 | 8-759-384-26 | s IC LM4041IM3-1.2 |

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|-----|----------------|----------------|
| IC8 | ▲ 8-759-300-28 | s IC HA11423MP |
| IC9 | 8-759-209-57 | s IC TC4569F |

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|----|----------------|------------------------|
| L1 | 1-410-380-31 | s INDUCTOR, CSIP 8.2uH |
| L2 | ▲ 9-882-890-01 | s COIL |

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|------|--------------|---------------------------|
| LED1 | 8-719-989-53 | s LED CL-200HR-C-TSL, RED |
|------|--------------|---------------------------|

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|----|--------------|---------------------------|
| Q1 | 8-729-028-91 | s TRANSISTOR DT414EU-T106 |
| Q2 | 8-729-028-91 | s TRANSISTOR DT414EU-T106 |
| Q3 | 8-729-905-38 | s TRANSISTOR 2SA481T106R |
| Q4 | 8-729-905-27 | s TRANSISTOR 2SA1576-R |
| Q5 | 8-729-403-30 | s TRANSISTOR KM6435 |

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|-----|--------------|--------------------------|
| Q6 | 8-729-024-57 | s TRANSISTOR 2SA1808-P |
| Q7 | 8-729-116-62 | s TRANSISTOR 2SA852 |
| Q8 | 8-729-403-33 | s TRANSISTOR XW6534 |
| Q9 | 8-729-038-81 | s TRANSISTOR 2SC4102T106 |
| Q10 | 8-729-038-81 | s TRANSISTOR 2SC4102T106 |

| | | |
|-----|--------------|--------------------------|
| Q11 | 8-729-038-81 | s TRANSISTOR 2SC4102T106 |
| Q12 | 8-729-927-90 | s TRANSISTOR 2SA1579-RS |
| Q13 | 8-729-729-81 | s TRANSISTOR 2SA1132-QR |
| Q17 | 8-729-042-51 | s TRANSISTOR 2SK1254L |
| Q18 | 8-729-042-51 | s TRANSISTOR 2SK1254L |

| | | |
|-----|--------------|---------------------------|
| Q19 | 8-729-905-38 | s TRANSISTOR 2SC4087T106R |
| Q20 | 8-729-905-27 | s TRANSISTOR 2SA1576-R |
| Q21 | 8-729-905-38 | s TRANSISTOR 2SC4081T106R |
| Q22 | 8-729-905-38 | s TRANSISTOR 2SC4081T106R |
| Q23 | 8-729-905-27 | s TRANSISTOR 2SA1576-R |

(VP-57 BOARD)

Ref. No.
or Q'ty Part No. SP Description

| | | |
|-----|--------------|--------------------------------|
| Q24 | 8-729-042-51 | s TRANSISTOR 2SK1254L |
| Q25 | 8-729-042-51 | s TRANSISTOR 2SK1254L |
| R1 | 1-216-707-11 | s METAL, CHIP 4.3K 0.50% 1/16W |
| R2 | 1-216-815-11 | s METAL, CHIP 330 5% 1/16W |
| R3 | 1-216-071-00 | s METAL 8.2K 5% 1/10W |
| R4 | 1-216-101-00 | s METAL 150K 5% 1/10W |
| R5 | 1-216-049-11 | s METAL 1K 5% 1/10W |

| | | |
|-----|--------------|-----------------------|
| ■ | 1-216-053-00 | s METAL 1.5K 5% 1/10W |
| R6 | 1-216-295-00 | s CONDUCTOR, CHIP 0 |
| ■ | 1-216-225-11 | s METAL 2.2K 5% 1/10W |
| R10 | 1-216-089-00 | s METAL 47K 5% 1/10W |
| R11 | 1-216-057-00 | s METAL 2.2K 5% 1/10W |

| | | |
|-----|--------------|----------------------------|
| R12 | 1-216-825-11 | s METAL 2.2K 5% 1/10W |
| R13 | 1-216-825-11 | s METAL 2.2K 5% 1/10W |
| R15 | 1-216-309-00 | s METAL, CHIP 5.6 5% 1/10W |
| R16 | 1-216-009-00 | s METAL 22 5% 1/10W |
| R17 | 1-216-073-00 | s METAL 10K 5% 1/10W |

| | | |
|-----|--------------|-----------------------------|
| R18 | 1-216-081-00 | s METAL 22K 5% 1/10W |
| R19 | 1-216-071-00 | s METAL 8.2K 5% 1/10W |
| R20 | 1-216-341-11 | s METAL 470 5% 1/10W |
| R21 | 1-216-041-11 | s METAL 470 5% 1/10W |
| R22 | 1-216-065-00 | s METAL, CHIP 4.7K 5% 1/10W |

| | | |
|-----|--------------|-----------------------|
| R23 | 1-216-079-00 | s METAL 18K 5% 1/10W |
| R24 | 1-216-041-11 | s METAL 470 5% 1/10W |
| R25 | 1-216-033-00 | s METAL 220 5% 1/10W |
| R26 | 1-216-033-00 | s METAL 220 5% 1/10W |
| R27 | 1-216-993-11 | s METAL 2.4K 5% 1/10W |

| | | |
|-----|--------------|-----------------------------|
| R28 | 1-216-065-00 | s METAL, CHIP 4.7K 5% 1/10W |
| R29 | 1-216-827-11 | s METAL, CHIP 3.3K 5% 1/10W |
| R30 | 1-216-073-00 | s METAL 10K 5% 1/10W |
| R31 | 1-216-031-00 | s METAL 180 5% 1/10W |
| R32 | 1-216-815-11 | s METAL, CHIP 330 5% 1/10W |

| | | |
|-----|--------------|-----------------------------|
| R33 | 1-216-829-11 | s METAL, CHIP 4.7K 5% 1/10W |
| R34 | 1-216-037-00 | s METAL, CHIP 330 5% 1/10W |
| R35 | 1-216-017-00 | s METAL 47 5% 1/10W |
| R36 | 1-216-067-00 | s METAL, CHIP 5.6K 5% 1/10W |
| R37 | 1-216-824-11 | s METAL, CHIP 1.8K 5% 1/10W |

| | | |
|-----|--------------|-----------------------------|
| R38 | 1-216-833-11 | s METAL 10K 5% 1/10W |
| R39 | 1-216-837-11 | s METAL 22K 5% 1/10W |
| R40 | 1-216-025-00 | s METAL 100 5% 1/10W |
| R41 | 1-216-069-00 | s METAL, CHIP 6.8K 5% 1/10W |
| R42 | 1-216-073-00 | s METAL 10K 5% 1/10W |

| | | |
|-----|--------------|-----------------------------|
| R43 | 1-216-133-00 | s METAL, CHIP 3.3M 5% 1/10W |
| R44 | 1-216-133-00 | s METAL, CHIP 3.3M 5% 1/10W |
| R45 | 1-216-133-00 | s METAL, CHIP 3.3M 5% 1/10W |
| R46 | 1-216-057-00 | s METAL 2.2K 5% 1/10W |
| R47 | 1-216-091-00 | s METAL 56K 5% 1/10W |

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|-----|--------------|-------------------------------|
| R48 | 1-216-089-00 | s METAL 47K 5% 1/10W |
| R49 | 1-216-085-00 | s METAL 33K 5% 1/10W |
| R54 | 1-216-864-11 | s CONDUCTOR, CHIP 0 |
| R55 | 1-216-085-00 | s METAL 33K 5% 1/10W |
| R56 | 1-216-829-11 | s METAL, CHIP 4.7K 0.5% 1/10W |

| | | |
|-----|--------------|-----------------------------|
| R58 | 1-216-085-00 | s METAL 33K 5% 1/10W |
| R59 | 1-216-836-11 | s METAL 18K 5% 1/10W |
| R60 | 1-216-081-00 | s METAL 22K 5% 1/10W |
| R61 | 1-216-079-00 | s METAL 18K 5% 1/10W |
| R62 | 1-216-061-00 | s METAL, CHIP 3.3K 5% 1/10W |

| | | |
|-----|--------------|----------------------|
| R63 | 1-216-081-00 | s METAL 22K 5% 1/10W |
| R64 | 1-216-081-00 | s METAL 22K 5% 1/10W |
| R65 | 1-216-833-11 | s METAL 10K 5% 1/10W |

(VZ-67 BOARD)

| Ref. No. | or Q'ty | Part No. | SP Description |
|----------|--------------|---------------------|----------------------------|
| R67 | 1 | 216-097-00 | s METAL 100K 5% 1/10W |
| R68 | 1 | 216-067-00 | s METAL 5.6K 5% 1/10W |
| R69 | 1 | 216-065-00 | s METAL 4.7K 5% 1/10W |
| R70 | 1 | 216-073-00 | s METAL 10K 5% 1/10W |
| R71 | 1 | 216-121-00 | s METAL CHIP IM 5% 1/10W |
| R73 | 1 | 216-049-11 | s METAL 1K 5% 1/10W |
| R74 | 1 | 216-025-00 | s METAL CHIP 100 5% 1/10W |
| R75 | 1 | 216-133-00 | s METAL CHIP 3.3M 5% 1/10W |
| R76 | 1 | 216-133-00 | s METAL CHIP 3.3M 5% 1/10W |
| R77 | 1 | 216-133-00 | s METAL CHIP 3.3M 5% 1/10W |
| R78 | 1 | 216-097-00 | s METAL 100K 5% 1/10W |
| R79 | 1 | 216-864-11 | s CONDUCTOR, CHIP 0 |
| R80 | 1 | 216-033-00 | s METAL CHIP 220 5% 1/10W |
| R81 | 1 | 216-049-11 | s METAL CHIP 1K 5% 1/10W |
| R82 | 1 | 216-309-00 | s METAL CHIP 5.5 5% 1/10W |
| R83 | 1 | 216-807-11 | s METAL CHIP 60 5% 1/10W |
| R85 | 1 | 216-113-00 | s METAL CHIP 4700 5% 1/10W |
| R86 | 1 | 216-821-11 | s METAL 1K 5% 1/10W |
| R87 | 1 | 216-075-00 | s METAL 12K 5% 1/10W |
| R88 | 1 | 216-083-00 | s METAL 27K 5% 1/10W |
| R89 | 1 | 216-073-00 | s METAL 10K 5% 1/10W |
| R90 | 1 | 216-071-00 | s METAL 8.2K 5% 1/10W |
| R91 | 1 | 216-025-00 | s METAL 100 5% 1/10W |
| R92 | 1 | 216-081-00 | s METAL 22K 5% 1/10W |
| R93 | 1 | 216-027-00 | s METAL 120 5% 1/10W |
| R94 | 1 | 216-833-11 | s METAL 10K 5% 1/10W |
| R95 | 1 | 216-843-11 | s METAL 60K 5% 1/10W |
| R96 | 1 | 216-845-11 | s METAL 100K 5% 1/10W |
| R97 | 1 | 202-930-11 | s METAL CHIP 7500 5% 1/10W |
| R98 | 1 | 216-834-11 | s METAL 12K 5% 1/10W |
| R99 | 1 | 216-832-11 | s METAL 8.2K 5% 1/10W |
| R100 | 1 | 216-833-11 | s METAL 33K 5% 1/10W |
| R101 | 1 | 216-057-00 | s METAL 2.2K 5% 1/10W |
| R102 | 1 | 216-851-11 | s METAL 330K 5% 1/10W |
| R103 | 1 | 216-840-11 | s METAL 39K 5% 1/10W |
| R104 | 1 | 216-830-11 | s METAL 5.6K 5% 1/10W |
| R105 | 1 | 216-833-11 | s METAL 10K 5% 1/10W |
| R106 | 1 | 216-831-11 | s METAL 6.8K 0.5% 1/10W |
| R108 | 1 | 216-821-11 | s METAL 1K 5% 1/10W |
| R109 | 1 | 216-864-11 | s CONDUCTOR, CHIP 0 |
| R110 | 1 | 216-005-00 | s METAL CHIP 15 5% 1/10W |
| R111 | 1 | 216-061-00 | s METAL CHIP 3.3 5% 1/10W |
| R112 | 1 | 216-065-00 | s METAL CHIP 4.7K 5% 1/10W |
| R113 | 1 | 216-308-00 | s METAL CHIP 4.7 5% 1/10W |
| R114 | 1 | 216-839-11 | s METAL 33K 5% 1/10W |
| R115 | 1 | 216-841-11 | s METAL 47K 5% 1/10W |
| R116 | 1 | 216-845-11 | s METAL 100K 5% 1/10W |
| R117 | 1 | 216-043-00 | s METAL CHIP 560 5% 1/10W |
| R118 | 1 | 216-041-11 | s METAL 470 5% 1/10W |
| R119 | 1 | 216-001-00 | s METAL CHIP 10 5% 1/10W |
| R128 | 9-882-889-01 | s CONDUCTOR, CHIP 0 | |
| R130 | 1 | 216-864-11 | s CONDUCTOR, CHIP 0 |
| RV2 | 1 | 241-741-11 | s RES, ADJ CERMET 50K |
| RV3 | 1 | 241-832-11 | s RES, ADJ CERMET 5K |
| RV4 | 1 | 241-832-11 | s RES, ADJ CERMET 5K |
| RV5 | 1 | 241-833-11 | s RES, ADJ CERMET 10K |
| RV6 | 1 | 241-826-11 | s RES, ADJ CERMET 100 |
| RV7 | 1 | 241-832-11 | s RES, ADJ CERMET 5K |
| RV8 | 1 | 241-838-11 | s RES, ADJ CERMET 500K |
| RV9 | 1 | 241-832-11 | s RES, ADJ CERMET 5K |

(VZ-67 BOARD)

| Ref. No. | or Q'ty | Part No. | SP Description |
|----------|---------|------------|-----------------------|
| RV10 | 1 | 241-828-11 | s RES, ADJ CERMET 500 |
| RV11 | 1 | 241-828-11 | s RES, ADJ CERMET 500 |
| RV12 | 1 | 241-832-11 | s RES, ADJ CERMET 5K |
| RV13 | 1 | 241-826-11 | s RES, ADJ CERMET 100 |
| RV15 | 1 | 241-827-11 | s RES, ADJ CERMET 200 |
| S1 | 1 | 762-488-11 | s SWITCH, TOGGLE |
| S2 | 1 | 762-320-11 | s SWITCH, TOGGLE |
| S3 | 1 | 762-489-11 | s SWITCH, TOGGLE |

VR-226 BOARDRef. No.
or Q'ty Part No. SP Description

| | | |
|------|--------------|---------------------------------|
| lpc | 1-761-130-11 | c MOUNTED CIRCUIT BOARD, VR-226 |
| lpc | 3-697-153-01 | c PLATE, GROUND (2) |
| C1 | 1-113-981-11 | s TANTALUM 22uF 20V |
| C2 | 1-163-021-91 | s CERAMIC, CHIP 0.01uF 10% 50V |
| C3 | 1-163-021-91 | s CERAMIC, CHIP 0.01uF 10% 50V |
| C4 | 1-163-037-91 | s CERAMIC, CHIP 0.022uF 10% 25V |
| C5 | 1-131-861-91 | s TANTALUM 4.7uF 20V 20V |
| C6 | 1-104-917-91 | s TANTALUM 15uF 20V 20V |
| C7 | 1-163-038-91 | s CERAMIC 0.1uF 25V |
| C8 | 1-163-021-91 | s CERAMIC, CHIP 0.01uF 10% 50V |
| CN11 | 1-559-529-11 | o HOUSING, 14P |
| D1 | 8-719-053-96 | s LED CL-2005R-C-TSL, RED |
| D2 | 8-719-053-96 | s LED CL-2005R-C-TSL, RED |
| IC1 | 8-759-939-53 | s IC BA225P-T2 |
| Q1 | 8-729-028-91 | s TRANSISTOR DTA144EUA-T106 |
| Q2 | 8-729-028-91 | s TRANSISTOR DTA144EUA-T106 |
| Q3 | 8-729-402-21 | s TRANSISTOR XH46501 |
| Q4 | 8-729-402-21 | s TRANSISTOR XH46501 |
| Q5 | 8-729-422-10 | s TRANSISTOR 2S3664 |
| R1 | 1-216-615-11 | s METAL, CHIP 23 0.5% 1/10W |
| R2 | 1-216-645-11 | s METAL, CHIP 560 0.5% 1/10W |
| R3 | 1-216-673-11 | s METAL, CHIP 2.2K 0.5% 1/10W |
| R4 | 1-216-683-11 | s METAL 22K 0.5% 1/10W |
| R5 | 1-216-683-11 | s METAL 22K 0.5% 1/10W |
| R6 | 1-216-683-11 | s METAL 22K 0.5% 1/10W |
| R7 | 1-216-772-11 | s METAL 680K 0.5% 1/10W |
| R8 | 1-216-691-11 | s METAL 47K 0.5% 1/10W |
| R9 | 1-216-693-11 | s METAL 56K 0.5% 1/10W |
| R10 | 1-216-693-91 | s RES, CHIP 0 |
| R11 | 1-216-691-11 | s METAL 47K 0.5% 1/10W |
| R13 | 1-216-683-11 | s METAL 22K 0.5% 1/10W |
| R14 | 1-216-643-11 | s METAL 470 0.5% 1/10W |
| R15 | 1-216-693-11 | s METAL 56K 0.5% 1/10W |
| R16 | 1-216-635-11 | s METAL, CHIP 220 0.5% 1/10W |
| RV1 | 1-238-293-11 | s RES, VAR CARBON 10K |
| RV2 | 1-238-290-11 | s RES, VAR CARBON 1K |
| RV4 | 1-241-269-41 | s RES, ADJ CERMET 500K |
| RV5 | 1-238-296-11 | s RES, VAR CARBON 10K |

FRAMERef. No.
or Q'ty Part No. SP Description

| | | |
|--|----------------|-------------------------|
| lpc | △ 1-251-439-11 | s CRT/OY ASSY, 2" NIDE |
| lpc | 1-777-028-21 | s CORE, CONNECTION (VP) |
| lpc | 1-777-252-11 | o CABLE, FLAT (14 CORE) |
| HARNESS (LP) | | |
| {CN2/VF-67 board to C R2 1/LP-101 board} | | |
| CN2 | 1-764-196-11 | o HOUSING, 8P |
| 8pcs | 1-695-215-11 | o CONTACT, IP AWG26-30 |
| CN21 | 1-565-652-11 | o HOUSING, 8P |
| 8pcs | 1-563-940-11 | s CONTACT, AWG26-30 |

3-3. Supplied Accessories

| Ref. No. or Q'ty | Part No. | SP Description |
|---------------------|--------------|----------------------|
| lpc | 1-542-296-11 | o MICROPHONE |
| lpc | 3-179-882-01 | o SPACER, MICROPHONE |
| lpc | 3-709-096-01 | s SCREEN, WINDOW |

Section 4

Semiconductor Pin Assignments

ここに記載されている半導体は、それぞれの機能を等価的に表したものであります。なお、互換性のない型名を併記していることがありますので、部品を交換するときは、Spare Partsの章を参照してください。

等価回路はICメーカーのデータブックに従いました。

Semiconductors of which functions are equivalent are described here. For parts replacement, refer to the section of Spare Parts in this manual. The circuit diagram of each IC is obtained from the IC data book published by the manufacturer.

| DIODE | Page | TRANSISTOR | Page | IC | Page |
|----------------|------|----------------|------|----------------|------|
| ISS3C2 | 4-2 | 2SA1576-R | 4-2 | BA10358F-E2 | 4-3 |
| | | 2SA1808-P | 4-2 | BA225F-T2 | 4-3 |
| CL-150D-CD | 4-2 | 2SA1808-PT106 | 4-2 | HA11423MP | 4-3 |
| CL-150PG-CD | 4-2 | 2SB1132-P | 4-2 | LM334MX | 4-3 |
| CL-150UR-CD | 4-2 | 2SC3360-N16 | 4-2 | LM4041EIM3-1.2 | 4-3 |
| CL-150UR-CD-T | 4-2 | 2SC4081T106R | 4-2 | TC4S01F | 4-3 |
| CL-200HR-C-TSL | 4-2 | 2SK1113 | 4-2 | TC4S69F | 4-3 |
| DAN202U | 4-2 | 2SK664 | 4-2 | TC4W53F | 4-3 |
| RD6.2UJN-T1 | 4-2 | DTA144EUA-T106 | 4-2 | | |
| V09C | 4-2 | XN6435 | 4-2 | | |
| V09G | 4-2 | XN6501 | 4-2 | | |
| V11N | 4-2 | XN6534 | 4-2 | | |

Diode, Transistor

DIODE

-TOP VIEW-



ISS302
ISS302-TE85L

TRANSISTOR

-TOP VIEW-



2SA1576-R
2SA1808-P
2SA1808-PT106
2SA1576T106R

-TOP VIEW-



2SK664
2SK664-TX



CL-150D-CD;ORANGE
CL-150PG-CD;GREEN
CL-150UR-CD;RED
CL-150UR-CD-T;RED
CL-150D-CD-T
CL-150PG-CD-T

-TOP VIEW-



2SB1132-P
2SB1132-T100-OR

-TOP VIEW-



DTA144EUA-T108



CL-200HR-C-TSL;RED

-TOP VIEW-

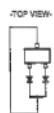


2SC3360-N16
2SC4061T106R
2SC3360-T1N17

-TOP VIEW-



XN6435
XN6435-TW



DAN202U
DAN202UT106



2SK1113

-TOP VIEW-



XN6501(MATSUSHITA)
XN6534
XN6501-TW
XN6534-TW



RD8.2UJN-T1

-TOP VIEW-



2SK863
2SK852-T1X3



V09C
V09G
V11N

IC

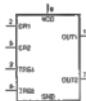
BA10358F-E2(NS)
UPC358G2-E2

DUAL OPERATIONAL AMPLIFIERS
—TOP VIEW—



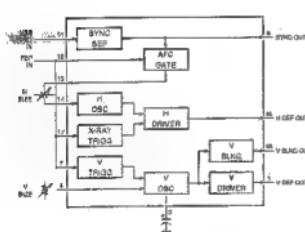
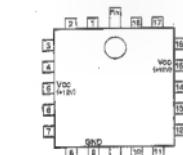
BA225F-T2(ROHM)FLAT PACKAGE

CR TIMER
—TOP VIEW—

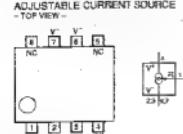


HA11423MP(HITACHI)FLAT PACKAGE

TV HV SYNC SIGNAL PROCESSOR
—TOP VIEW—

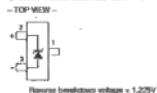


LM334MX(NS)FLAT PACKAGE
ADJUSTABLE CURRENT SOURCE
—TOP VIEW—



LM4041EIM3-12(NS)

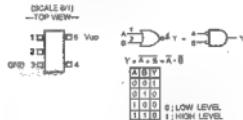
SHUNT VOLTAGE REFERENCE
—TOP VIEW—



Power breakdown voltage = 1.25V.

TC4S01F(TOSHIBA)CHIP PACKAGE
TC4S01F(TE85R)

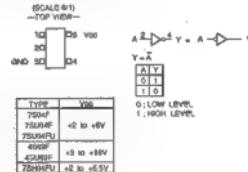
C-MOS 2-INPUT NOR GATE
—TOP VIEW—



| TYPE | V _{DD} |
|-------|-----------------|
| 7S01F | +2 to +4V |
| 7S02F | +2 to +6V |
| 7S03F | +2 to +8V |
| 7S04F | +2 to +10V |

TC4S99F(TOSHIBA)CHIP PACKAGE
TC4S99F(TE85R)

C-MOS INVERTER
—TOP VIEW—



TC4W53F(TOSHIBA)CHIP PACKAGE(5.0 X 3.1)
C-MOS 2-CHANNEL MULTIPLEXER / DEMULTIPLEXER

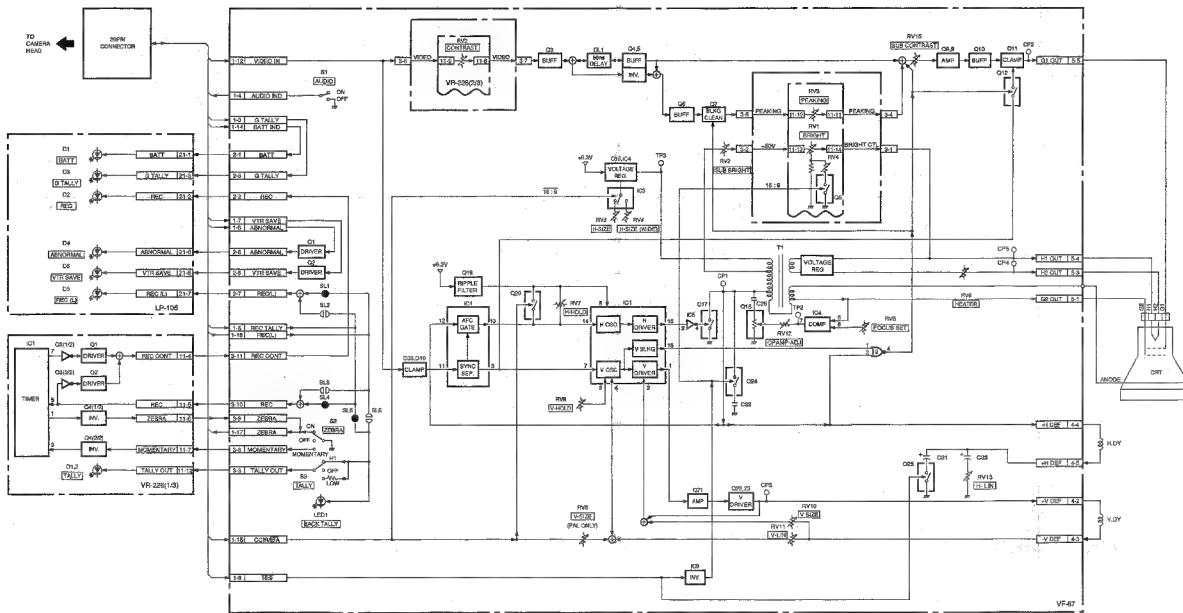


| CONTROLS | IN1 | A | OUT |
|---------------|-----|---|------|
| 0; LOW LEVEL | 0 | 0 | 0 |
| 1; HIGH LEVEL | 0 | 1 | 1 |
| X; DONT CARE | 1 | X | OPEN |

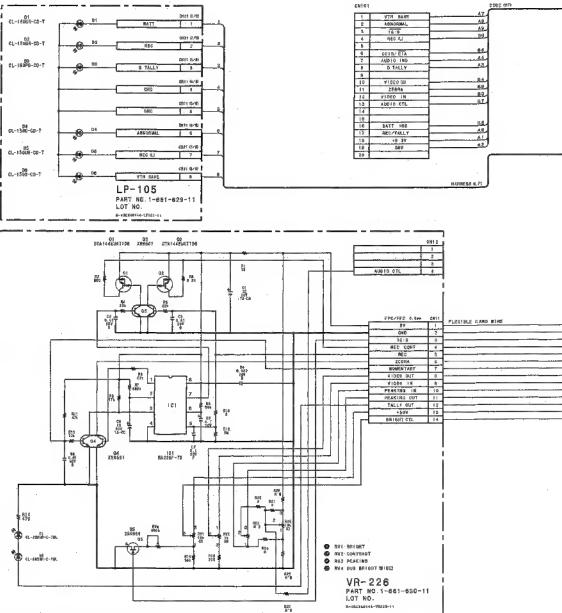
VF block VF block

Section 5

Diagrams and Board Layouts



Overall



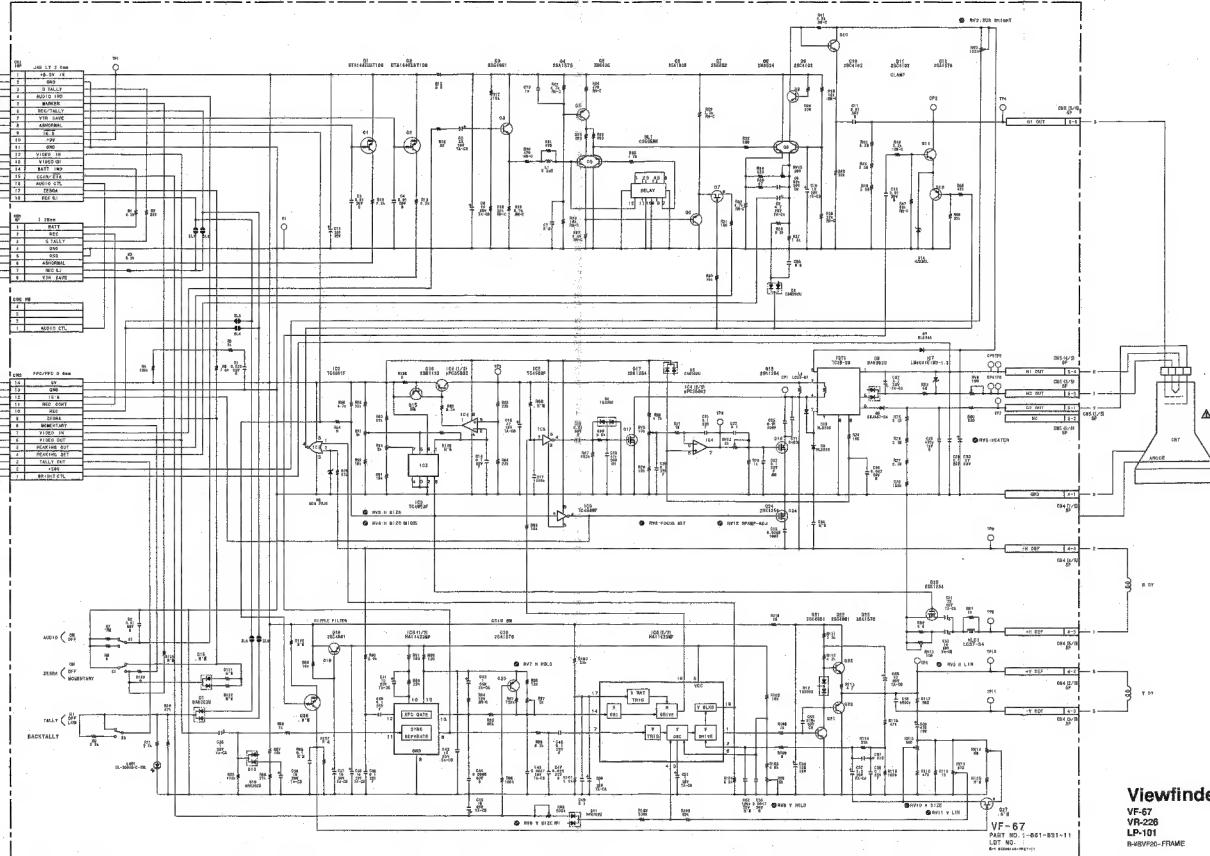
5-2

5-2

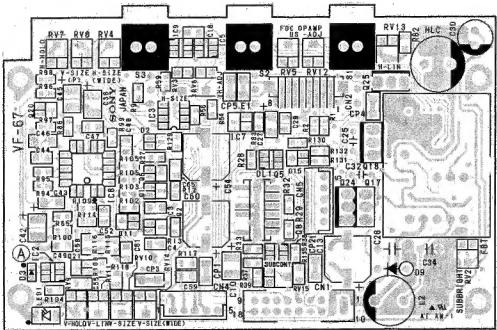
A**B****C****D****E****F****G**

BVF-V20WV/20WCE

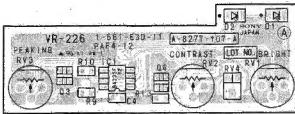
H



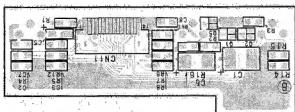
Viewfinder
VF-67
VR-226
LP-101
R-WRVP200-FRAME



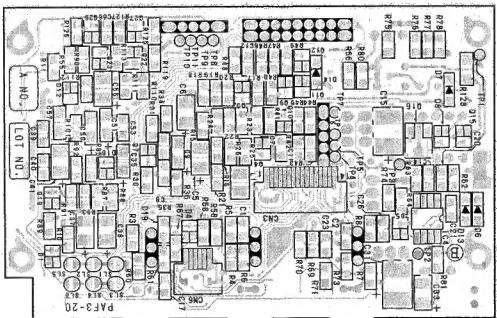
VF-67 -A SIDE-
SUFFIX : -11



VR-226 -A SIDE-
SUFFIX : -11



VR-226 -B SIDE-
SUFFIX : -11



VF-60 -B SIDE-
SUFFIX : -11

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